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March 1996

AN ANALYSIS OF COUNTRYSIDE SURVEY 1990 WOODLAND DATA

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Access to Data and Dissemination Services (ADDS) (DOE/CRO 164)

This is a contract between DOE and NERC (ITE). The aims of the contract are:

1) To improve access to, and advice to users, about data from Countryside Survey 1990 (CS1990) and related projects.
2) To promote the use and development of the Countryside Information System (CIS).

CS1990 was a major survey of the status of the British countryside. Through integration of remote sensing and field survey it provides a comprehensive source for information about stock and change in the British countryside. CIS is a computer decision support system, designed to answer policy relevant questions about the British countryside.

The ADDS contract provides for a full time post-holder, based in the Land Use Section at ITE Merlewood. The nature of the work carried out under the ADDS contract falls under the following headings:

1) Answering ad hoc queries about CS1990 data.
2) Further analysis of CS1990 data.
3) Training and support for users of CS1990 data in CIS.
4) Production of a newsletter for CIS users.
5) Provision of a secretariat for the CIS Joint Management Team.

For further information about the ADDS contract and the use of the this contract contact:

Dr A Stott, EWD, Department of the Environment, Tollgate House, Houlton Street, Bristol, BS2 9DJ.

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Executive Summary

This report presents an analysis of a sample of GB woodland. The analysis is based on data collected as part of a larger survey of rural land use called 'Countryside Survey 1990' (CS1990).

'Woodland' in CS1990 was defined as 'an area of trees of greater than 0.25ha, with a canopy cover of greater than 25%. It is estimated that there were 2312 '000 ha of woodland in GB in 1990. Figure 1 illustrates a difference between uplands and lowlands, the woodland of marginal upland and upland landscapes is predominantly conifer whilst in pastural and arable landscapes broadleaf woodland is prevalent.

Five main types of information were collected about woodland during CS1990, these were: dominant species, age, condition, evidence of use and additional features.

Conifers were the dominant species in 1306 '000 ha (56%) of woodland. The principal species were Sitka spruce and Scots pine. In broadleaf woodland the dominant species was most often Oak or Birch.

Half of woodland was aged 20 to 100 years. More woodland was aged less than 20 years than was aged over 100 years. Figure 2 shows that younger woodland tends to be conifer and older woodland broadleaf. However, comparing the proportions of conifer versus broadleaf between woodland aged 1-4 years and 5-20 years shows the trend, documented by the FC, of a shift towards the planting of broadleaf species.

The majority (67%) of woodland was classed as managed. Much (76%) of managed woodland was conifer, compared with unmanaged woodland which was predominantly broadleaf (Figure 3).

Declining and unmanaged - improvable woodland accounts for 1% and 5% of woodland. Both conditions were frequently associated with grazing. Figure 4 shows that woodlands were more likely to be unmanaged in lowland landscapes.

An estimated 1422 '000 ha (62%) of woodland had evidence of timber production. The majority of woodland used for timber production is dominated by conifer species (82%), was planted (86%) and classed as is managed (86%).

Bracken (either scattered or dense) was present in an estimated 660 '000 ha (20%) of woodland. Scattered bracken was most frequent in woodland aged 20-100 years and dense bracken in woodland aged over 100 years.

For a significant proportion of sampled woodland no age or condition was recorded. For age this seems to be the case where assessment was difficult, such as in woodland with varied age structure or where woodland was composed of species which are difficult to age such as hawthorn and alder. Condition was defined both in terms of management and health of woodland and this may have led to difficulty in applying these codes.

The Forestry Commission estimate of woodland (the FC definition of woodland is similar to that used in CS1990) for 1979-82 is 2.1 million ha (Locke 1987) and for 1989-90 is 2.4 million ha (FC Facts and Figures 1989-1990). The CS1990 estimate of 2.3 million ha of woodland falls between these figures.

1 Background

1.1 This report presents an analysis of a sample of GB woodland. The analysis is based on data collected as part of a larger survey of rural land use called 'Countryside Survey 1990' (CS1990).

1.2 The results of CS1990 are summarised in the Countryside Survey 1990 Main Report (Barr et al 1993). In terms of woodland this report includes national estimates for five categories: conifer, broadleaf, mixed, felled and shrub. Much more information was collected about the woodland surveyed in CS1990, including detail of age; species composition of the canopy; management condition; evidence of uses; and some additional woodland features, but to date no further analysis has been done on these data.

1.3 The analysis presented in this report was commissioned by the Department of the Environment in consultation with the Forestry Commission and has been undertaken by the Institute of Terrestrial Ecology (ITE) as part of the Access to Data and Dissemination Services (ADDS) contract (DOE/CRO 164).

2 Data collection - CS1990 field survey

2.1 The following notes are a brief description of CS1990 field survey methodology and some of the terms referred to in this report. Barr et al (1993) provides a more comprehensive description of CS1990 and more detail of field survey methodology can be found in the Field Survey Handbook (Barr 1990).

2.2 During CS1990 a stratified random sample of 508 of the 240222 1km squares in GB were surveyed. The sample was stratified by the ITE Land Classification (Bunce et al in press). In each square a survey of land use was conducted for six themes, one of which was 'forestry/ woodland/ trees', others include 'agriculture/ natural vegetation' and 'buildings/ structures/ communications'. The land cover was mapped and a description, based on a pre-determined list of codes, was recorded for each land parcel.

2.3 The structure of descriptions was a Primary code denoting the land cover type, qualified by Secondary codes to describe the land cover in more detail. For the forestry/ woodland/ trees theme ten Primary codes and sixty six Secondary codes were given in the Field Survey Handbook (Barr, 1990) (The section of the Field Survey Handbook defining codes for woodland is reproduced in Appendix 1). Where a feature could not be described using the suggested list of Primary and Secondary codes, Unique codes were created by surveyors. Surveyors were discouraged from using Unique codes because they would not necessarily be recorded in an objective and consistent way, limiting their value in future analyses. No limit was set to the number of Secondary codes used in a description, and there are numerous possible combinations of codes. This approach to field recording maximised the amount of information surveyors could record about a complex and variable subject using relatively simple mapping procedures.

2.4 The mapped land cover of sample squares has been digitised using the Arcinfo GIS system. An analysis of the digitised land parcels, along with the coded descriptions of the land covers, is stored in a database at ITE Merlewood (using the Oracle database management system).

3 Data analysis

3.1 Woodland in CS1990 is defined as 'an area of trees of greater than 0.25ha, with a canopy cover of greater than 25%'. Secondary codes recorded in CS1990 provide a more detailed description of woodland. For the current analysis Secondary codes relating to woodland have been grouped into five types: Dominant species; Age; Condition; Use; Features. All field survey codes relating to forestry are defined in Appendix 1.

3.2 Unique codes have been assigned to existing Secondary codes where possible. Where this was not possible the remaining Unique code have been excluded from the analysis. In the majority of cases the excluded Unique codes provide further information about particular woods not

covered by the standard list of codes, but since this information was not collected in a constant manner it could not be used in the current analysis.

3.3 Tree species were recorded during CS1990 where they constituted more than 25% of the woodland canopy. The proportion of each recorded species was assigned to one of four bands (codes 256-9 in Appendix 1). Species and proportion have been summarised as 'dominant species', where the species in greatest proportion is assumed to be the dominant. In cases where species were in equal proportion the woodland has been assigned to either mixed conifer, mixed broadleaf or mixed conifer and broadleaf. For the sake of simplicity, only the fourteen most common species have been identified in this analysis, other species named in the survey or recorded as unspecified conifer or broadleaf have been re-assigned to either other conifer or other broadleaf.

3.4 Surveyors assessed the predominant age of each woodland and assigned it to one of four age bands. Similarly woodland condition was assessed and assigned to one of four categories (codes 261-4 and 275-8 in Appendix 1).

3.5 Evidence of the woodland being used and additional woodland features, were recorded where present (codes 266-71 and 281-95 in Appendix 1). Thus, an individual wood may have evidence of several concurrent uses and more than one additional feature present.

3.6 All woodland descriptions should have one code from each of the dominant species, age and condition code types. Descriptions with missing codes are indicated in the results as 'Not recorded'. For the use and feature code types the lack of a code indicates absence and this is indicated as 'None' in the results.

3.7 Data were analysed with SQL queries generated using 'Andyne GQL version 3.3' query interface. The interface was developed alongside this analysis as part of a pilot project to improve access to CS1990 data. The statistical formulae used for calculation of national estimates and associated standard error follow the methods described in Appendix 3 of the CS1990 Main Report (Barr et al 1993: p163-172).

3.8 The data will be made available through the Countryside Information System (CIS). This is a computer decision support system, designed to answer policy relevant questions about the British countryside. If you are interested in using the data in CIS, contact Gavin Stark at ITE Merlewood (address inside back cover).

3.9 Calculation of the area of woodland requires an estimate of the amount of land in GB. For this report, land area is the population of GB 1km squares (as indicated in Barr et al 1993) with the sea portion of coastal squares estimated from the sea area recorded in sample squares during CS1990 (based on 1:100 000 scale OS maps). This method is appropriate where a GB estimate is required, but the situation is more complicated for data in CIS format. In CIS a user may select a region and calculate an estimate for an attribute such as woodland, based on the proportion of Land Classes represented in the region. CIS has an internal dataset with an estimate of the amount of land in all 1km squares and so for any user defined region the area of land can be estimated. This dataset was derived from digitsation of OS 1:250 000 scale maps and approximates the area of sea in each 1km square. When compared with the sea area recorded at 1:100 000 scale during CS1990 significant differences were found (Barr et al 1993). A comparison for the estimates presented in this report and those calculated from the same data using CIS showed differences of between 1-2%. This is within the level of accuracy with which these estimates should be treated. Proposals for future developments to CIS include updating the current land area dataset to gain the benefit of recent, more accurate, digitisation.

Figure 1 Area of Woodland by Landscape Type

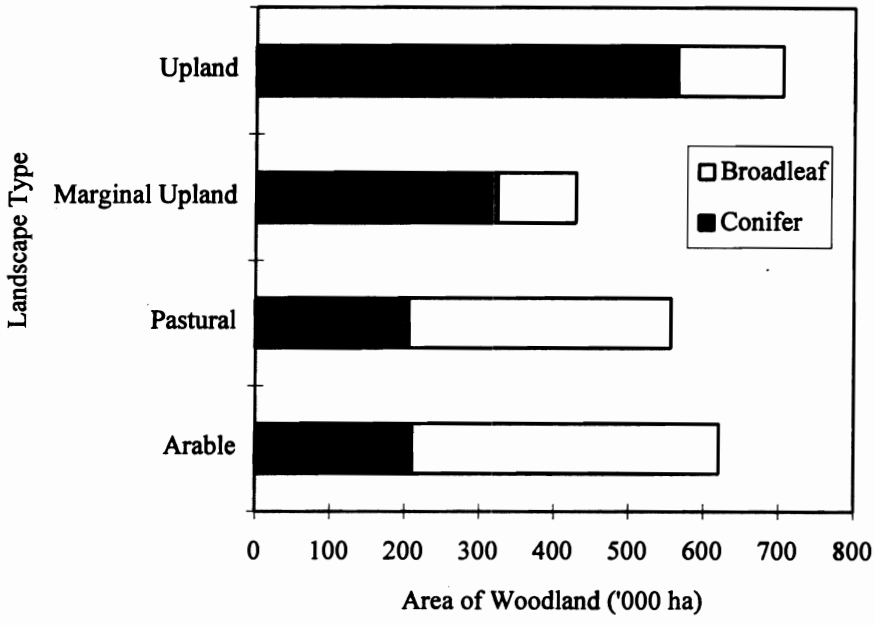
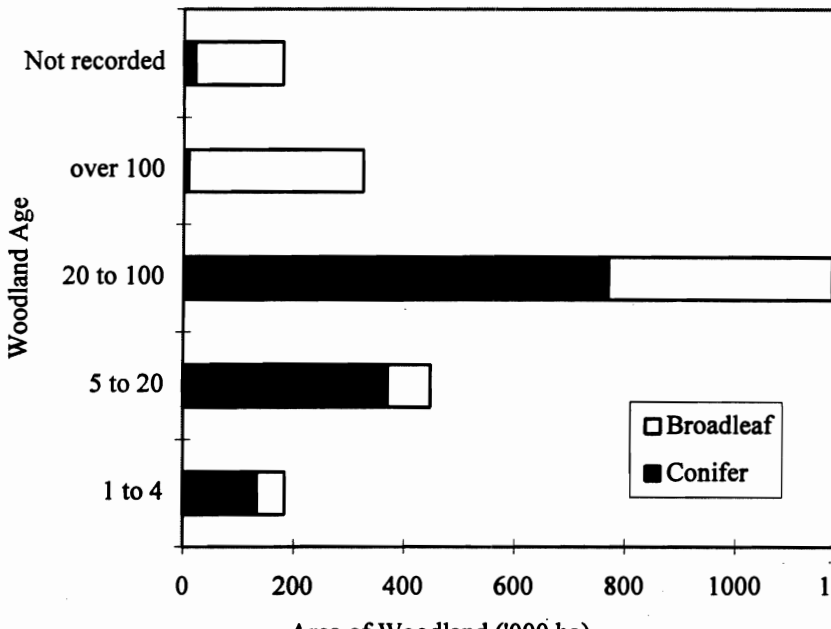


Figure 2 Area of Woodland by Predominant Woodland Age



4 Results

4.1 Using the results obtained from CS1990 it is estimated that there were 2312 '000 ha of woodland in GB in 1990. Figures 1 illustrates a difference between lowland and upland landscape types: broadleaved woodland is predominant in arable and pastural landscapes, compared with upland marginal and upland landscapes where conifer woodland predominates (landscape types are aggregations of the ITE Land Classes reflecting the dominance of certain land cover types). The distribution of woodland differs between lowland and upland landscapes. In the lowlands the density of woodland is evenly spread, whilst in the uplands the density of woodland varies between absence from high mountains and the Northern Isles to high densities for parts of the uplands of Scotland and Northern England.

4.2 The total area of forestry was estimated as 2600 '000 ha in Barr et al (1993). This figure refers to land where trees were the predominant land cover and for a further 600 '000 ha trees occur but were not the predominant land cover, trees in parkland for example. Woodland (as defined in 3.1) accounts for 72% of the total area of land with trees.

4.3 Conifers were the dominant species over 1306 '000 ha (56%) of woodland (this does not include the mixed conifer and broadleaf woodland category) (Table 1). The dominant species in conifer woodland was most often Sitka spruce (639 '000 ha) or Scots pine (176 '000 ha). The dominant species in broadleaf woodland was most often Oak (155 '000 ha) or Birch (127 '000 ha).

4.4 Half of woodland was in the 20 to 100 years age band and 66% of this was conifer (Table 1). The proportion of conifer verses broadleaf in each age category is shown in Figure 2. More woodland was aged less than 20 years than was aged over 100 years. Woodland aged 1-4 years was 73% conifer, compared with 83% conifer for woodland aged 5-20 years.

4.5 The majority (67%) of woodland was classed as managed (Table 2) and for 76% of managed woodland conifers were the dominant species. In contrast to this, the proportion of woodland dominated by conifers in the other condition classes is small (Figure 3).

4.6 Managed woodland accounts for over 50% of woodland in all landscape types. This is illustrated in Figure 4. Managed woodland is the predominant woodland condition in upland landscapes with unmanaged woodland being principally found in the lowland landscapes.

4.7 The two largest area estimates for woodland with multiple use were timber production and sporting/game at 76 '000 ha (3% of woodland); and timber production and landscape at 15 '000 ha (1% of woodland) (Table 11). All the remaining combinations accounted for less than 1% of the total estimated area of woodland.

4.8 An estimated 1422 '000 ha (62%) of woodland had evidence of timber production. This implies that for 38% of the estimated area of woodland there was no evidence of timber production. The majority of the estimated area of woodland used for timber production is dominated by conifer species (82%), was planted (86%) and classed as managed (86%) (Table 3, 8 and 9).

4.9 For 25% of woodland there was no evidence of the six recorded uses (these are detailed in Appendix 1). Typically these woods have mixed broadleaf species. A larger proportion of older woodlands had no evidence of use (Table 6). Woodland where there was no evidence of use was typically unmanaged (either thriving or improvable) (Table 8).

4.10 Half of woodland was planted, the majority of this (85%) was dominated by conifer species (Table 4).

4.11 Bracken (either scattered or dense) was present in an estimated 660 '000 ha of woodland (20%). Figure 5 shows the occurrence of bracken in woodland by woodland age. Scattered bracken was in greatest proportion in woodland aged 20-100 years and dense bracken in woodland aged over 100 years (Table 7). A large proportion of woodland with bracken had no evidence of use (Table 9).

Figure 3 Area of Woodland by Woodland Condition

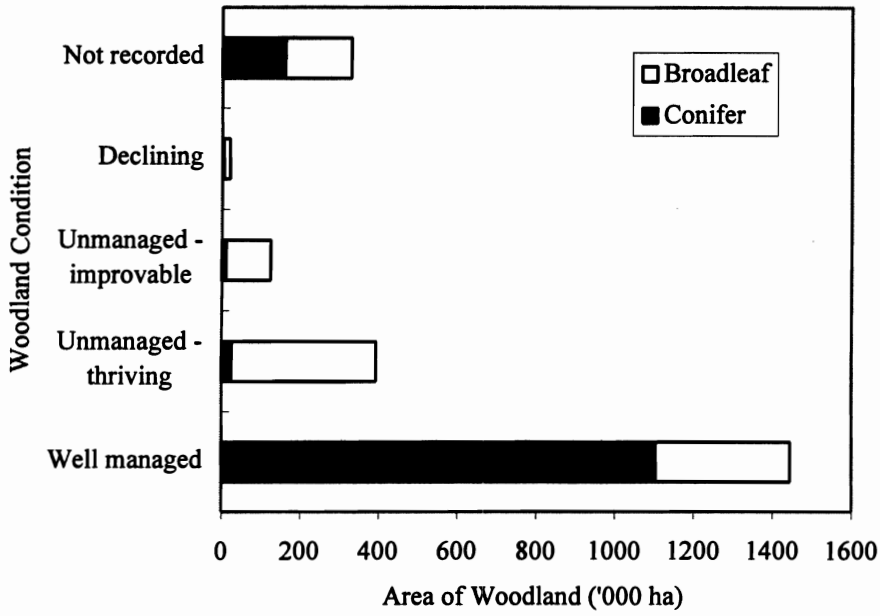


Figure 4 Woodland Condition by Landscape Types

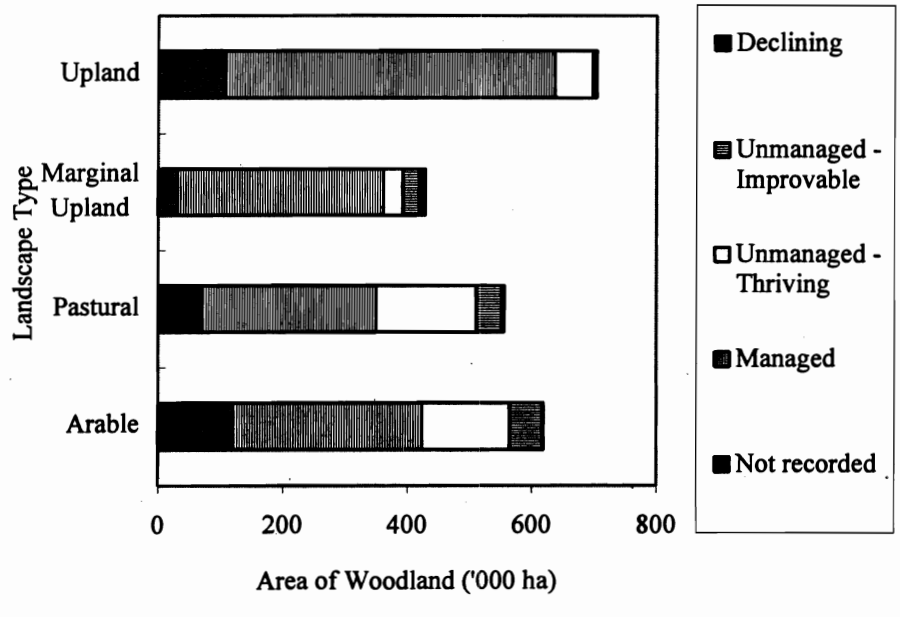
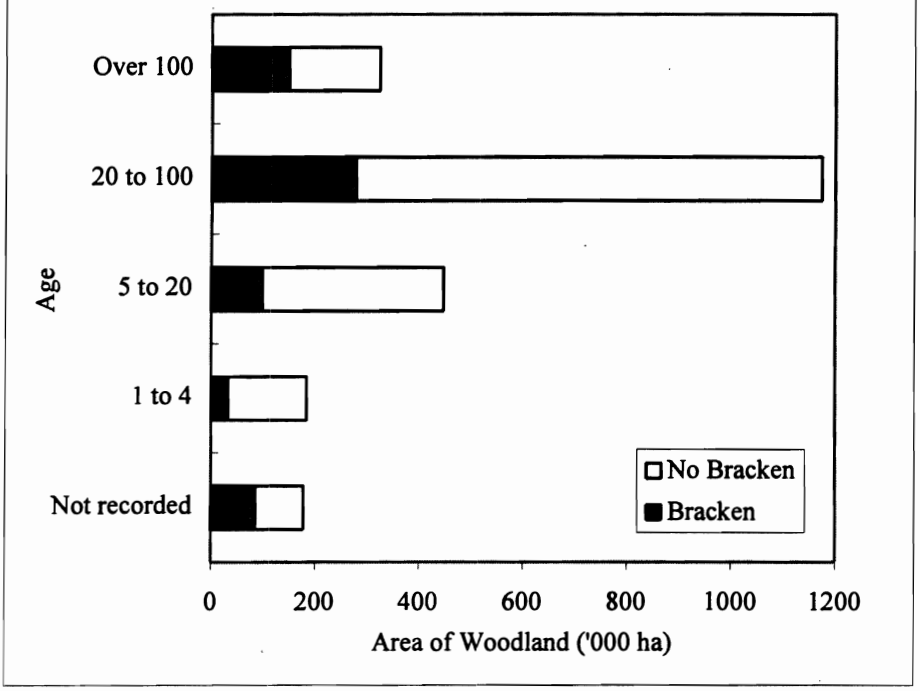


Figure 5 Occurence of Bracken in Woodland of Different Ages



4.12 Most woodland with windblow or dead standing trees was classed as managed, although as a percentage of all managed woodland the proportion is small (Table 9).

4.13 Woodland classed as declining and unmanaged improvable accounts for 1% and 5% of the total area of woodland respectively, a total area of 144 '000 ha. Both conditions were frequently associated with grazing and scattered bracken. Of a total of 67 '000 ha of grazed woodland 60% was classified as unmanaged improvable (Table 9).

4.14 Since the total amount of declining woodland recorded was small, it is beyond the scope of CS1990 to make detailed predictions about it. However, comparing declining woodland with unmanaged improvable woodland (Tables 2,5,8 and 9) shows that the two differ in character. For declining woodland the most frequently associated species were Lodgepole pine and mixed broadleaf, the woodland was frequently over 100 years old and there was evidence of a variety of uses. In contrast to this, for unmanaged improvable woodland the most frequently associated species were Ash, Birch, Oak and mixed broadleaf, the woodland was frequently aged 20-100 years and with no evidence of use.

5 Accounting for missing data

5.1 Some of the survey descriptions of woodland are incomplete, lacking Secondary codes for either species, age or condition. This is indicated as 'not recorded' in the results. Less than 1% of woodland descriptions have no species code, but 8% have no age and 14% no condition.

5.2 CS1990 involved complex mapping and subsequent data processing. A portion of error might be expected to have occurred during the survey, but further explanation is needed to explain the high incidence of missing age and condition codes.

5.3 That age and condition codes were more frequently omitted than species codes parallels the degree of difficulty in determining the appropriate code. This view is reinforced when the character of woodland with missing age codes is examined. In 41% of cases the woodland was either mixed broadleaf or dominated by oak and in only 12% of cases was the woodland dominated by a conifer species. One would expect woodland composed of broadleaf species (particularly mixed broadleaf woodland) to have a more varied age structure. This would make it more difficult to assign one age band as the predominant age. Over 50% of woodlands dominated by hawthorn or alder had no age recorded. This may reflect difficulty in aging these species in the field.

5.4 Assessing the condition of woodland proved difficult in the field. This was reported by surveyors. Surveyors were given training in the assessment of woodland condition and definitions were supplied in the Field Survey Handbook. A possible explanation for difficulty is that the four condition codes are defined both on the basis of managed verses unmanaged and healthy verses unhealthy. Health of the woodland is defined in terms of natural regeneration and varied age structure. No indication is given of how recent management activity should have been for the woodland to qualify as managed (does this mean any woodland which has been planted qualifies as being managed?).

5.5 Since the lack of use or feature codes also indicates absence, the results give no indication of missing codes. There was no evidence of any the coded uses in 24% of woodland or of any of the additional features in 19% of woodland.

6 Comparison with other statistics

6.1 The Forestry Commission (FC) undertook a census of woodland and trees between 1979 and 1982 (Locke 1987). The definition of woodland used for this study was similar to that for CS1990; both have a minimum area of 0.25ha and the minimum canopy cover is similar (20% for the FC census and 25% for CS1990). The FC estimate for 1979-82 is 2.1 million ha, compared with 2.3 million ha for CS1990. Table 13 compares these and other national estimates of woodland.

6.2 The FC produce annual statistics for forestry in GB, based on the 1980 census of woodland and modified in the light of known changes to FC land and private woodland through FC grants. For 1989-90 the FC estimate there was 2326 '000 ha of woodland in GB, an increase of 216 '000 ha from the 1979-82 census. The CS1990 estimate for area of woodland is within 20 '000 ha of the FC 1989-90 figure. Differences in definition and sampling errors, mean that these figures are not strictly comparable and greater divergence is seen when the figures are broken down to the country level (as in Table 13).

6.3 The FC figure for known new tree planting between 1985 and 1989 is 106 '000 ha. An estimated further 51 '000 ha of restocking and 1 '000 ha of planting without grant aid makes a total of 158 '000 ha for the area of woodland planted over these years. This figures is half the estimated 328 '000 ha of woodland aged 1-4 years estimated from CS1990. The figures are not strictly comparable since the CS1990 estimate refers to the surveyors estimate of the predominant age of woodland and the FC figure to documented new plantings only.

6.4 Comparing the proportions of conifer versus broadleaf between woodland aged 1-4 years and 5-20 years in CS1990 shows the trend, documented by the FC, towards the planting of broadleaf species. Subsequent to 1990 this trend has continued so that the amount of broadleaf planting now exceeds that of conifer (FC figures).

6.5 There is an estimated 533 '000 ha of ancient woodland and 316 '000 ha of semi-natural woodland in GB (figures based on woodland documented in the Ancient Woodland Inventory, Spencer 1992 and Roberts 1992). No comparable classification of woodland was attempted in CS1990. The most appropriate comparison to make is possibly between woodland not recorded as planted in CS1990 of which there was an estimated 1287 '000 ha. This is more than the combined total of 849 '000 ha for ancient and semi-natural woodland. Part of the explanation for this is a difference in definitions, the Ancient Woodland Inventory only holds information for woodland of greater than 2ha, whilst the CS1990 estimate is for woodland of greater than 0.25ha.

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8 Acknowledgments

8.1 The authors would like to thank Andrew Stott (DOE) and Simon Gillam (FC) for their helpful comments on earlier drafts of this report.

Table 1 The estimated area of woodland, together with associated standard error and percentages for all combinations of age and dominant species. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

Dominant species		AGE 1-4	5-20	20-100	> 100	Not recorded	Total
Larch	**Area**	**1**	**56**	**65**	**1**	**0**	**123**
	SE	1	23	16	0	0	30
	% of row	*1*	*46*	*53*	*0*	*0*	*100*
	% of col	*1*	*13*	*6*	*0*	*0*	*5*
Lodgepole Pine	**Area**	**1**	**30**	**16**	**0**	**0**	**46**
	SE	1	26	13	0	0	29
	% of row	*1*	*65*	*34*	*0*	*0*	*100*
	% of col	*0*	*7*	*1*	*0*	*0*	*2*
Mixed Conifer	**Area**	**48**	**56**	**113**	**4**	**4**	**225**
	SE	44	25	37	3	2	36
	% of row	*22*	*25*	*50*	*2*	*2*	*100*
	% of col	*26*	*12*	*10*	*1*	*2*	*10*
Norway spruce	**Area**	**7**	**8**	**47**	**2**	**0**	**66**
	SE	4	3	13	2	0	14
	% of row	*11*	*13*	*72*	*4*	*1*	*100*
	% of col	*4*	*2*	*4*	*1*	*0*	*3*
Other Conifer	**Area**	**1**	**5**	**21**	**1**	**5**	**31**
	SE	0	3	8	1	3	9
	% of row	*2*	*16*	*66*	*2*	*15*	*100*
	% of col	*0*	*1*	*2*	*0*	*3*	*1*
Scots Pine	**Area**	**0**	**15**	**156**	**2**	**3**	**176**
	SE	0	11	39	1	2	42
	% of row	*0*	*9*	*89*	*1*	*2*	*100*
	% of col	*0*	*3*	*13*	*1*	*2*	*8*
Sitka spruce	**Area**	**76**	**200**	**353**	**0**	**9**	**639**
	SE	30	48	88	0	6	119
	% of row	*12*	*31*	*55*	*0*	*1*	*100*
	% of col	*41*	*45*	*30*	*0*	*5*	*28*
Alder	**Area**	**0**	**0**	**5**	**2**	**7**	**14**
	SE	0	0	3	1	4	5
	% of row	*0*	*3*	*36*	*11*	*50*	*100*
	% of col	*0*	*0*	*0*	*0*	*4*	*1*
Ash	**Area**	**0**	**1**	**33**	**17**	**13**	**65**
	SE	0	0	11	10	10	21
	% of row	*0*	*1*	*51*	*27*	*21*	*100*
	% of col	*0*	*0*	*3*	*5*	*7*	*3*
Beech	**Area**	**0**	**0**	**14**	**16**	**3**	**33**
	SE	0	0	5	6	2	9
	% of row	*0*	*1*	*40*	*49*	*10*	*100*
	% of col	*0*	*0*	*1*	*5*	*2*	*1*
Birch	**Area**	**0**	**19**	**63**	**37**	**9**	**127**
	SE	0	8	14	17	7	28
	% of row	*0*	*15*	*49*	*29*	*7*	*100*
	% of col	*0*	*4*	*5*	*11*	*5*	*6*
Hawthorn	**Area**	**0**	**0**	**0**	**0**	**1**	**2**
	SE	0	0	0	0	1	1
	% of row	*0*	*12*	*20*	*9*	*59*	*100*
	% of col	*0*	*0*	*0*	*0*	*1*	*0*
Mixed Broadleaf	**Area**	**14**	**16**	**134**	**137**	**44**	**345**

	SE	6	7	17	28	10	40
	% of row	*4*	*5*	*39*	*40*	*13*	*100*
	% of col	*8*	*4*	*11*	*42*	*24*	*15*
Mixed Conifer and	**Area**	**33**	**34**	**57**	**21**	**28**	**173**
Broadleaf	SE	26	13	14	9	12	63
	% of row	*19*	*20*	*33*	*12*	*16*	*100*
	% of col	*18*	*8*	*5*	*7*	*15*	*7*
Oak	**Area**	**1**	**0**	**45**	**78**	**31**	**155**
	SE	1	0	12	28	12	32
	% of row	*1*	*0*	*29*	*51*	*20*	*100*
	% of col	*1*	*0*	*4*	*24*	*17*	*7*
Other Broadleaf	**Area**	**0**	**2**	**22**	**2**	**1**	**28**
	SE	0	1	9	1	1	10
	% of row	*1*	*9*	*77*	*8*	*4*	*100*
	% of col	*0*	*1*	*2*	*1*	*1*	*1*
Poplar	**Area**	**0**	**1**	**10**	**0**	**1**	**12**
	SE	0	1	5	0	1	5
	% of row	*3*	*10*	*82*	*0*	*5*	*100*
	% of col	*0*	*0*	*1*	*0*	*0*	*1*
Sycamore	**Area**	**0**	**1**	**15**	**4**	**3**	**23**
	SE	0	0	6	2	2	7
	% of row	*2*	*3*	*65*	*18*	*12*	*100*
	% of col	*0*	*0*	*1*	*1*	*2*	*1*
Willow	**Area**	**0**	**1**	**6**	**0**	**3**	**11**
	SE	0	1	3	0	2	2
	% of row	*0*	*13*	*54*	*1*	*31*	*100*
	% of col	*0*	*0*	*1*	*0*	*2*	*0*
Not recorded	**Area**	**0**	**1**	**1**	**0**	**15**	**17**
	SE	0	0	0	0	7	8
	% of row	*0*	*7*	*6*	*0*	*87*	*100*
	% of col	*0*	*0*	*0*	*0*	*8*	*1*
Total	**Area**	**184**	**448**	**1174**	**325**	**180**	**2312**
	SE	27	74	124	49	60	182
	% of row	*8*	*19*	*51*	*14*	*8*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*

Table 2 The estimated area of woodland, together with associated standard error and percentages for all combinations of condition and dominant species. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

DOMINANT SPECIES		CONDITION					
		Managed	Unmanaged - thriving	Unmanaged - improvable	Declining	Not recorded	Total
Larch	**Area**	**93**	**7**	**3**	**0**	**20**	**123**
	SE	25	4	2	0	11	30
	% of row	*76*	*5*	*3*	*0*	*16*	*100*
	% of col	*6*	*2*	*3*	*0*	*6*	*5*
Lodgepole Pine	**Area**	**40**	**0**	**0**	**4**	**1**	**46**
	SE	25	0	0	4	1	29
	% of row	*88*	*1*	*0*	*9*	*2*	*100*
	% of col	*3*	*0*	*0*	*22*	*0*	*2*
Mixed Conifer	**Area**	**169**	**6**	**1**	**0**	**49**	**225**
	SE	57	3	1	0	25	36
	% of row	*75*	*3*	*0*	*0*	*22*	*100*
	% of col	*12*	*2*	*1*	*0*	*15*	*10*
Norway spruce	**Area**	**58**	**3**	**0**	**0**	**5**	**66**
	SE	14	1	0	0	2	14
	% of row	*88*	*4*	*0*	*0*	*8*	*100*
	% of col	*4*	*1*	*0*	*0*	*2*	*3*
Other Conifer	**Area**	**24**	**1**	**0**	**0**	**6**	**31**
	SE	8	1	0	0	3	9
	% of row	*79*	*3*	*0*	*0*	*19*	*100*
	% of col	*2*	*0*	*0*	*0*	*2*	*1*
Scots Pine	**Area**	**157**	**6**	**2**	**0**	**12**	**176**
	SE	41	2	1	0	4	42
	% of row	*89*	*3*	*1*	*0*	*7*	*100*
	% of col	*11*	*1*	*2*	*0*	*4*	*8*
Sitka spruce	**Area**	**563**	**3**	**4**	**0**	**69**	**639**
	SE	112	2	3	0	28	119
	% of row	*88*	*0*	*1*	*0*	*11*	*100*
	% of col	*39*	*1*	*3*	*0*	*21*	*28*
Alder	**Area**	**0**	**6**	**2**	**1**	**5**	**14**
	SE	0	3	2	1	3	5
	% of row	*3*	*43*	*14*	*7*	*32*	*100*
	% of col	*0*	*2*	*2*	*5*	*1*	*1*
Ash	**Area**	**7**	**18**	**19**	**0**	**21**	**65**
	SE	3	7	11	0	17	21
	% of row	*10*	*27*	*30*	*1*	*32*	*100*
	% of col	*0*	*4*	*15*	*2*	*6*	*3*
Beech	**Area**	**10**	**14**	**3**	**0**	**7**	**33**
	SE	5	6	1	0	4	9
	% of row	*29*	*41*	*8*	*1*	*22*	*100*
	% of col	*1*	*3*	*2*	*1*	*2*	*1*
Birch	**Area**	**31**	**73**	**14**	**0**	**10**	**127**
	SE	19	19	8	0	5	28
	% of row	*24*	*57*	*11*	*0*	*8*	*100*
	% of col	*2*	*18*	*11*	*0*	*3*	*6*
Hawthorn	**Area**	**0**	**1**	**1**	**0**	**0**	**2**
	SE	0	0	0	0	0	1
	% of row	*7*	*48*	*31*	*0*	*14*	*100*
	% of col	*0*	*0*	*0*	*0*	*0*	*0*
Mixed Broadleaf	**Area**	**100**	**155**	**24**	**6**	**61**	**346**

	SE	26	22	5	3	13	40
	% of row	*29*	*45*	*7*	*2*	*18*	*100*
	% of col	*7*	*39*	*19*	*29*	*19*	*15*
Mixed Conifer and	**Area**	**111**	**33**	**6**	**4**	**18**	**173**
Broadleaf	SE	32	10	3	4	6	63
	% of row	*64*	*19*	*4*	*2*	*11*	*100*
	% of col	*8*	*9*	*5*	*21*	*6*	*7*
Oak	**Area**	**49**	**47**	**40**	**3**	**15**	**155**
	SE	20	21	13	2	6	32
	% of row	*32*	*31*	*26*	*2*	*10*	*100*
	% of col	*3*	*12*	*32*	*17*	*5*	*7*
Other Broadleaf	**Area**	**10**	**7**	**3**	**1**	**7**	**28**
	SE	6	2	1	1	5	10
	% of row	*36*	*24*	*10*	*2*	*27*	*100*
	% of col	*1*	*2*	*2*	*3*	*2*	*1*
Poplar	**Area**	**5**	**3**	**2**	**0**	**3**	**12**
	SE	4	3	1	0	2	5
	% of row	*44*	*22*	*13*	*0*	*21*	*100*
	% of col	*0*	*1*	*1*	*0*	*1*	*1*
Sycamore	**Area**	**10**	**7**	**1**	**0**	**6**	**23**
	SE	6	3	0	0	2	7
	% of row	*41*	*32*	*2*	*0*	*25*	*100*
	% of col	*1*	*2*	*0*	*0*	*2*	*1*
Willow	**Area**	**3**	**5**	**0**	**0**	**2**	**11**
	SE	2	2	0	0	2	2
	% of row	*29*	*44*	*4*	*1*	*22*	*100*
	% of col	*0*	*1*	*0*	*0*	*1*	*0*
Not recorded	**Area**	**5**	**0**	**0**	**0**	**13**	**17**
	SE	4	0	0	0	6	8
	% of row	*26*	*0*	*1*	*0*	*73*	*100*
	% of col	*0*	*0*	*0*	*0*	*4*	*1*
Total	**Area**	**1445**	**393**	**124**	**20**	**329**	**2312**
	SE	157	45	20	7	52	182
	% of row	*63*	*17*	*5*	*1*	*14*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*

Table 3 The estimated area of woodland, together with associated standard error and percentages for all combinations of uses and dominant species. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

		USE							
Dominant species		**Landscape**	**Nature cons.**	**Public recreation**	**Shelter**	**Sporting/ game**	**Timber production**	**None**	**Total**
Larch	**Area**	**2**	**0**	**0**	**0**	**6**	**99**	**18**	**125**
	SE	1	0	0	0	3	26	11	28
	% of row	*1*	*0*	*0*	*0*	*5*	*79*	*15*	*100*
	% of col	*1*	*0*	*0*	*2*	*3*	*7*	*3*	*5*
Lodgepole Pine	**Area**	**0**	**0**	**0**	**0**	**0**	**45**	**0**	**46**
	SE	0	0	0	0	0	29	0	29
	% of row	*0*	*0*	*0*	*0*	*0*	*99*	*1*	*100*
	% of col	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*2*
Mixed Conifer	**Area**	**2**	**0**	**0**	**1**	**6**	**192**	**29**	**231**
	SE	2	0	0	1	3	61	15	63
	% of row	*1*	*0*	*0*	*0*	*3*	*83*	*13*	*100*
	% of col	*2*	*0*	*0*	*4*	*4*	*14*	*5*	*9*
Norway spruce	**Area**	**0**	**0**	**0**	**0**	**6**	**51**	**14**	**71**
	SE	0	0	0	0	4	13	5	15
	% of row	*0*	*0*	*0*	*0*	*9*	*72*	*19*	*100*
	% of col	*0*	*0*	*0*	*1*	*4*	*4*	*2*	*3*
Other Conifer	**Area**	**0**	**0**	**0**	**0**	**1**	**27**	**3**	**31**
	SE	0	0	0	0	1	8	1	8
	% of row	*1*	*0*	*0*	*0*	*2*	*86*	*10*	*100*
	% of col	*0*	*0*	*0*	*0*	*0*	*2*	*1*	*1*
Scots Pine	**Area**	**1**	**0**	**0**	**0**	**18**	**151**	**21**	**191**
	SE	0	0	0	0	12	40	11	43
	% of row	*0*	*0*	*0*	*0*	*9*	*79*	*11*	*100*
	% of col	*0*	*0*	*0*	*1*	*11*	*11*	*4*	*8*
Sitka spruce	**Area**	**1**	**0**	**0**	**2**	**1**	**589**	**52**	**644**
	SE	1	0	0	2	0	117	22	119
	% of row	*0*	*0*	*0*	*0*	*0*	*91*	*8*	*100*
	% of col	*0*	*0*	*0*	*8*	*0*	*41*	*9*	*26*
Alder	**Area**	**1**	**3**	**0**	**0**	**1**	**0**	**10**	**15**
	SE	0	3	0	0	1	0	4	5
	% of row	*4*	*20*	*0*	*0*	*7*	*3*	*66*	*100*
	% of col	*0*	*10*	*0*	*0*	*1*	*0*	*2*	*1*
Ash	**Area**	**3**	**1**	**0**	**0**	**8**	**5**	**51**	**68**
	SE	2	0	0	0	3	3	21	21
	% of row	*5*	*1*	*0*	*0*	*11*	*7*	*75*	*100*
	% of col	*3*	*2*	*0*	*0*	*5*	*0*	*8*	*3*
Beech	**Area**	**6**	**0**	**6**	**0**	**3**	**3**	**16**	**33**
	SE	3	0	4	0	2	1	6	8
	% of row	*17*	*0*	*18*	*0*	*9*	*9*	*46*	*100*
	% of col	*4*	*0*	*8*	*0*	*2*	*0*	*3*	*1*
Birch	**Area**	**10**	**7**	**4**	**4**	**12**	**2**	**92**	**130**
	SE	4	5	4	2	8	1	26	28
	% of row	*8*	*5*	*3*	*3*	*9*	*1*	*70*	*100*
	% of col	*8*	*21*	*6*	*15*	*7*	*0*	*15*	*5*
Hawthorn	**Area**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**2**
	SE	0	0	0	0	0	0	0	1
	% of row	*20*	*0*	*0*	*0*	*35*	*0*	*45*	*100*
	% of col	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mixed Broadleaf	**Area**	**49**	**13**	**33**	**6**	**36**	**59**	**178**	**374**

	SE	11	6	23	2	9	15	23	39
	% of row	*13*	*3*	*9*	*2*	*10*	*16*	*48*	*100*
	% of col	*37*	*40*	*46*	*25*	*22*	*4*	*29*	*15*
Mixed Conifer and	**Area**	**34**	**0**	**0**	**0**	**18**	**118**	**33**	**204**
Broadleaf	SE	14	0	0	0	7	33	9	38
	% of row	*17*	*0*	*0*	*0*	*9*	*58*	*16*	*100*
	% of col	*26*	*1*	*0*	*2*	*11*	*8*	*5*	*8*
Oak	**Area**	**8**	**4**	**26**	**10**	**36**	**50**	**57**	**191**
	SE	3	2	20	5	21	22	13	39
	% of row	*4*	*2*	*14*	*5*	*19*	*26*	*30*	*100*
	% of col	*6*	*11*	*37*	*41*	*22*	*4*	*9*	*8*
Other Broadleaf	**Area**	**2**	**2**	**1**	**0**	**7**	**4**	**14**	**29**
	SE	1	1	1	0	6	3	6	9
	% of row	*8*	*5*	*3*	*0*	*23*	*13*	*47*	*100*
	% of col	*2*	*5*	*1*	*0*	*4*	*0*	*2*	*1*
Poplar	**Area**	**0**	**0**	**0**	**0**	**5**	**12**	**1**	**17**
	SE	0	0	0	0	3	5	0	6
	% of row	*1*	*0*	*0*	*0*	*28*	*68*	*3*	*100*
	% of col	*0*	*0*	*0*	*0*	*3*	*1*	*0*	*1*
Sycamore	**Area**	**10**	**0**	**0**	**0**	**1**	**3**	**10**	**23**
	SE	6	0	0	0	1	2	3	7
	% of row	*41*	*0*	*0*	*0*	*5*	*11*	*42*	*100*
	% of col	*7*	*0*	*0*	*0*	*1*	*0*	*2*	*1*
Willow	**Area**	**2**	**3**	**0**	**0**	**1**	**1**	**4**	**11**
	SE	1	2	0	0	1	1	2	3
	% of row	*18*	*28*	*0*	*1*	*13*	*5*	*35*	*100*
	% of col	*2*	*10*	*0*	*0*	*1*	*0*	*1*	*0*
Not recorded	**Area**	**0**	**0**	**0**	**0**	**1**	**12**	**6**	**18**
	SE	0	0	0	0	1	7	4	8
	% of row	*0*	*0*	*0*	*0*	*5*	*63*	*32*	*100*
	% of col	*0*	*0*	*0*	*0*	*1*	*1*	*1*	*1*
Total	**Area**	**132**	**31**	**71**	**24**	**168**	**1422**	**608**	**2456**
	SE	24	10	37	7	32	162	65	183
	% of row	*5*	*1*	*3*	*1*	*7*	*58*	*25*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one use.

Table 4 The estimated area of woodland, together with associated standard error and percentages for all combinations of features and dominant species. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

		FEATURES							
Dominant species		**Bracken - dense**	**Bracken - scattered**	**Dead standing trees**	**Felling/ stumps**	**Grazing (stock)**	**Natural regen.**	**Planted**	**Ploughed land**
Larch	**Area**	**7**	**40**	**1**	**20**	**1**	**23**	**78**	**6**
	SE	4	15	1	11	1	13	25	6
	% of row	*3*	*18*	*0*	*9*	*1*	*10*	*35*	*3*
	% of col	*4*	*8*	*1*	*14*	*2*	*7*	*8*	*6*
Lodgepole Pine	**Area**	**0**	**0**	**0**	**0**	**0**	**0**	**40**	**26**
	SE	0	0	0	0	0	0	25	26
	% of row	*0*	*0*	*0*	*0*	*0*	*0*	*59*	*38*
	% of col	*0*	*0*	*0*	*0*	*0*	*0*	*4*	*27*
Mixed Conifer	**Area**	**8**	**43**	**18**	**3**	**0**	**2**	**144**	**7**
	SE	6	26	18	2	0	1	56	6
	% of row	*3*	*14*	*6*	*1*	*0*	*1*	*47*	*2*
	% of col	*5*	*9*	*17*	*2*	*1*	*1*	*14*	*7*
Norway spruce	**Area**	**0**	**10**	**8**	**5**	**0**	**2**	**42**	**0**
	SE	0	5	6	3	0	2	12	0
	% of row	*0*	*11*	*8*	*6*	*0*	*2*	*45*	*0*
	% of col	*0*	*2*	*7*	*4*	*0*	*1*	*4*	*0*
Other Conifer	**Area**	**5**	**4**	**0**	**6**	**0**	**5**	**20**	**0**
	SE	4	2	0	3	0	3	7	0
	% of row	*10*	*7*	*0*	*12*	*0*	*9*	*38*	*0*
	% of col	*3*	*1*	*0*	*4*	*0*	*1*	*2*	*0*
Scots Pine	**Area**	**13**	**85**	**2**	**14**	**4**	**27**	**94**	**11**
	SE	8	29	1	9	3	17	29	11
	% of row	*5*	*30*	*1*	*5*	*1*	*9*	*33*	*4*
	% of col	*8*	*18*	*1*	*10*	*6*	*8*	*9*	*12*
Sitka spruce	**Area**	**15**	**9**	**26**	**56**	**0**	**11**	**453**	**13**
	SE	15	6	19	27	0	7	104	9
	% of row	*2*	*1*	*3*	*7*	*0*	*1*	*60*	*2*
	% of col	*9*	*2*	*24*	*40*	*0*	*3*	*44*	*14*
Alder	**Area**	**0**	**2**	**0**	**0**	**3**	**4**	**0**	**0**
	SE	0	2	0	0	2	3	0	0
	% of row	*2*	*12*	*0*	*0*	*16*	*20*	*0*	*0*
	% of col	*0*	*0*	*0*	*0*	*5*	*1*	*0*	*0*
Ash	**Area**	**9**	**5**	**4**	**1**	**1**	**16**	**3**	**0**
	SE	9	2	2	1	1	10	2	0
	% of row	*11*	*6*	*5*	*1*	*2*	*19*	*4*	*0*
	% of col	*5*	*1*	*4*	*1*	*2*	*5*	*0*	*0*
Beech	**Area**	**1**	**3**	**1**	**2**	**0**	**5**	**3**	**0**
	SE	0	2	1	1	0	2	1	0
	% of row	*1*	*8*	*2*	*4*	*1*	*11*	*7*	*0*
	% of col	*0*	*1*	*1*	*1*	*1*	*1*	*0*	*0*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one feature.

Table 4 continued

Dominant species		FEATURES							
		Regrowth - cut stump	Ride/ firebreak	Staked trees	Tree protectors	Under planting	Windblow	None	Total
Larch	**Area**	**0**	**4**	**0**	**0**	**1**	**17**	**22**	**221**
	SE	0	4	0	0	1	9	12	38
	% of row	*0*	*2*	*0*	*0*	*1*	*8*	*10*	*100*
	% of col	*0*	*22*	*2*	*0*	*8*	*14*	*4*	*7*
Lodgepole Pine	**Area**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**68**
	SE	0	0	0	0	0	0	1	36
	% of row	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*100*
	% of col	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*
Mixed Conifer	**Area**	**0**	**6**	**0**	**0**	**0**	**17**	**58**	**306**
	SE	0	6	0	0	0	9	26	71
	% of row	*0*	*2*	*0*	*0*	*0*	*6*	*19*	*100*
	% of col	*0*	*29*	*0*	*0*	*1*	*14*	*10*	*9*
Norway spruce	**Area**	**0**	**2**	**0**	**0**	**0**	**5**	**19**	**94**
	SE	0	2	0	0	0	3	8	17
	% of row	*0*	*3*	*0*	*0*	*0*	*5*	*20*	*100*
	% of col	*0*	*13*	*0*	*0*	*0*	*4*	*3*	*3*
Other Conifer	**Area**	**1**	**0**	**0**	**0**	**0**	**3**	**9**	**53**
	SE	1	0	0	0	0	3	4	11
	% of row	*1*	*0*	*0*	*0*	*0*	*6*	*17*	*100*
	% of col	*4*	*0*	*0*	*0*	*0*	*3*	*1*	*2*
Scots Pine	**Area**	**0**	**3**	**0**	**0**	**0**	**7**	**26**	**285**
	SE	0	2	0	0	0	3	18	51
	% of row	*0*	*1*	*0*	*0*	*0*	*2*	*9*	*100*
	% of col	*0*	*15*	*0*	*0*	*0*	*5*	*4*	*9*
Sitka spruce	**Area**	**0**	**4**	**0**	**0**	**0**	**2**	**163**	**753**
	SE	0	4	0	0	0	2	58	125
	% of row	*0*	*1*	*0*	*0*	*0*	*0*	*22*	*100*
	% of col	*0*	*22*	*2*	*1*	*0*	*1*	*27*	*23*
Alder	**Area**	**0**	**0**	**0**	**0**	**0**	**1**	**8**	**20**
	SE	0	0	0	0	0	1	4	6
	% of row	*2*	*0*	*0*	*0*	*0*	*5*	*41*	*100*
	% of col	*3*	*0*	*0*	*0*	*1*	*1*	*1*	*1*
Ash	**Area**	**0**	**0**	**0**	**1**	**0**	**14**	**29**	**84**
	SE	0	0	0	0	0	10	11	21
	% of row	*0*	*0*	*0*	*1*	*0*	*17*	*34*	*100*
	% of col	*2*	*0*	*1*	*2*	*1*	*11*	*5*	*3*
Beech	**Area**	**0**	**0**	**0**	**0**	**1**	**7**	**19**	**42**
	SE	0	0	0	0	1	4	7	9
	% of row	*0*	*0*	*1*	*1*	*2*	*17*	*44*	*100*
	% of col	*0*	*0*	*2*	*1*	*5*	*6*	*3*	*1*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one feature.

Table 4 continued

Dominant species		FEATURES							
		Bracken - dense	Bracken - scattered	Dead standing trees	Felling /stumps	Grazing (stock)	Natural regen.	Planted	Ploughed land
Birch	**Area**	**42**	**55**	**17**	**4**	**11**	**66**	**6**	**0**
	SE	19	14	11	3	6	18	4	0
	% of row	*19*	*25*	*8*	*2*	*5*	*30*	*3*	*0*
	% of col	*24*	*11*	*16*	*3*	*17*	*19*	*1*	*0*
Hawthorn	**Area**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
	SE	0	0	0	0	1	0	0	0
	% of row	*14*	*12*	*0*	*0*	*35*	*12*	*0*	*0*
	% of col	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*
Mixed Broadleaf	**Area**	**36**	**78**	**12**	**7**	**15**	**86**	**32**	**0**
	SE	12	15	5	2	4	16	8	0
	% of row	*7*	*16*	*3*	*1*	*3*	*18*	*7*	*0*
	% of col	*20*	*16*	*11*	*5*	*23*	*25*	*3*	*0*
Mixed Conifer and	**Area**	**10**	**57**	**17**	**3**	**0**	**36**	**92**	**28**
Broadleaf	SE	3	17	10	2	0	15	32	25
	% of row	*4*	*20*	*6*	*1*	*0*	*13*	*32*	*10*
	% of col	*6*	*12*	*15*	*2*	*0*	*10*	*9*	*30*
Oak	**Area**	**23**	**78**	**1**	**11**	**27**	**55**	**5**	**0**
	SE	11	27	1	6	11	23	3	0
	% of row	*9*	*30*	*1*	*4*	*10*	*21*	*2*	*0*
	% of col	*13*	*16*	*1*	*8*	*40*	*16*	*1*	*0*
Other Broadleaf	**Area**	**1**	**11**	**1**	**0**	**1**	**2**	**2**	**0**
	SE	1	6	1	0	1	1	1	0
	% of row	*2*	*29*	*2*	*0*	*2*	*5*	*5*	*0*
	% of col	*0*	*2*	*1*	*0*	*1*	*1*	*0*	*0*
Poplar	**Area**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**
	SE	0	0	0	0	0	1	1	0
	% of row	*0*	*0*	*0*	*3*	*0*	*6*	*16*	*0*
	% of col	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Sycamore	**Area**	**2**	**4**	**1**	**0**	**0**	**2**	**1**	**0**
	SE	2	2	1	0	0	2	1	0
	% of row	*7*	*14*	*2*	*1*	*1*	*9*	*5*	*0*
	% of col	*1*	*1*	*1*	*0*	*0*	*1*	*0*	*0*
Willow	**Area**	**0**	**1**	**0**	**2**	**1**	**4**	**3**	**0**
	SE	0	1	0	2	1	2	2	0
	% of row	*0*	*8*	*0*	*10*	*7*	*24*	*19*	*0*
	% of col	*0*	*0*	*0*	*1*	*2*	*1*	*0*	*0*
Not recorded	**Area**	**0**	**1**	**0**	**5**	**0**	**0**	**5**	**4**
	SE	0	1	0	5	0	0	3	4
	% of row	*2*	*4*	*1*	*30*	*0*	*1*	*27*	*22*
	% of col	*0*	*0*	*0*	*4*	*0*	*0*	*0*	*4*
Total	**Area**	**174**	**486**	**109**	**140**	**67**	**346**	**1025**	**94**
	SE	38	68	46	35	14	52	146	46
	% of row	*5*	*15*	*3*	*4*	*2*	*11*	*31*	*3*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one feature.

Table 4 continued

Dominant species		FEATURES							
		Regrowth - cut stump	Ride/ firebreak	Staked trees	Tree protectors	Under planting	Windblow	None	Total
Birch	**Area**	**0**	**0**	**0**	**0**	**0**	**5**	**12**	**217**
	SE	0	0	0	0	0	5	5	33
	% of row	*0*	*0*	*0*	*0*	*0*	*2*	*5*	*100*
	% of col	*2*	*0*	*0*	*0*	*0*	*4*	*2*	*7*
Hawthorn	**Area**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
	SE	0	0	0	0	0	0	0	1
	% of row	*0*	*0*	*0*	*0*	*5*	*6*	*17*	*100*
	% of col	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*
Mixed Broadleaf	**Area**	**3**	**0**	**14**	**21**	**9**	**22**	**151**	**486**
	SE	2	0	8	8	6	6	31	44
	% of row	*1*	*0*	*3*	*4*	*2*	*4*	*31*	*100*
	% of col	*24*	*0*	*67*	*63*	*53*	*17*	*25*	*15*
Mixed Conifer and	**Area**	**0**	**0**	**4**	**4**	**1**	**6**	**26**	**285**
Broadleaf	SE	0	0	2	2	1	3	8	49
	% of row	*0*	*0*	*1*	*2*	*0*	*2*	*9*	*100*
	% of col	*0*	*0*	*18*	*13*	*5*	*5*	*4*	*9*
Oak	**Area**	**6**	**0**	**0**	**3**	**4**	**9**	**36**	**259**
	SE	5	0	0	1	2	3	11	41
	% of row	*2*	*0*	*0*	*1*	*2*	*3*	*14*	*100*
	% of col	*47*	*0*	*1*	*9*	*25*	*7*	*6*	*8*
Other Broadleaf	**Area**	**2**	**0**	**1**	**1**	**0**	**7**	**10**	**38**
	SE	2	0	1	1	0	6	5	10
	% of row	*4*	*0*	*3*	*3*	*0*	*18*	*27*	*100*
	% of col	*12*	*0*	*5*	*3*	*0*	*5*	*2*	*1*
Poplar	**Area**	**0**	**0**	**0**	**0**	**0**	**1**	**6**	**10**
	SE	0	0	0	0	0	1	3	5
	% of row	*5*	*0*	*0*	*2*	*0*	*9*	*59*	*100*
	% of col	*4*	*0*	*0*	*1*	*0*	*1*	*1*	*0*
Sycamore	**Area**	**0**	**0**	**0**	**1**	**0**	**0**	**14**	**26**
	SE	0	0	0	1	0	0	6	7
	% of row	*0*	*0*	*1*	*4*	*0*	*0*	*55*	*100*
	% of col	*0*	*0*	*1*	*3*	*0*	*0*	*2*	*1*
Willow	**Area**	**0**	**0**	**0**	**1**	**0**	**1**	**4**	**17**
	SE	0	0	0	1	0	1	2	5
	% of row	*0*	*0*	*0*	*3*	*0*	*8*	*22*	*100*
	% of col	*0*	*0*	*0*	*2*	*0*	*1*	*1*	*1*
Not recorded	**Area**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**18**
	SE	0	0	0	0	0	0	1	7
	% of row	*1*	*0*	*0*	*0*	*0*	*1*	*11*	*100*
	% of col	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
Total	**Area**	**13**	**19**	**21**	**33**	**17**	**125**	**614**	**3285**
	SE	6	10	8	9	7	26	88	210
	% of row	*0*	*1*	*1*	*1*	*1*	*4*	*19*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one feature.

Table 5 The estimated area of woodland, together with associated standard error and percentages for all combinations of age and condition. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

		AGE					
CONDITION		**1-4**	**5-20**	**20-100**	**>100**	**Not recorded**	**Total**
Managed	**Area**	**140**	**328**	**819**	**105**	**53**	**1445**
	SE	56	63	114	31	14	157
	% of col	*76*	*73*	*70*	*32*	*30*	*63*
	% of row	*10*	*23*	*57*	*7*	*4*	*100*
Unmanaged thriving	**Area**	**2**	**35**	**170**	**144**	**42**	**393**
	SE	2	12	23	29	12	45
	% of col	*1*	*8*	*14*	*44*	*23*	*17*
	% of row	*0*	*9*	*43*	*37*	*11*	*100*
Unmanaged improvable	**Area**	**0**	**3**	**60**	**17**	**45**	**124**
	SE	0	2	13	5	15	20
	% of col	*0*	*1*	*5*	*5*	*25*	*5*
	% of row	*0*	*3*	*48*	*14*	*36*	*100*
Declining	**Area**	**0**	**4**	**5**	**8**	**3**	**20**
	SE	0	4	3	5	2	6
	% of col	*0*	*1*	*0*	*2*	*2*	*1*
	% of row	*0*	*22*	*25*	*38*	*15*	*100*
Not recorded	**Area**	**42**	**78**	**121**	**51**	**37**	**329**
	SE	21	29	29	17	9	52
	% of col	*23*	*17*	*10*	*16*	*21*	*14*
	% of row	*13*	*24*	*37*	*15*	*11*	*100*
Total	**Area**	**184**	**448**	**1174**	**325**	**180**	**2312**
	SE	60	74	124	49	27	182
	% of col	*100*	*100*	*100*	*100*	*100*	*100*
	% of row	*8*	*19*	*51*	*14*	*8*	*100*

Table 6 The estimated area of woodland, together with associated standard error and percentages for all combinations of uses and age. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

USE		AGE 1-4	5-20	20-100	> 100	Not recorded	Total
Landscape	**Area**	**9**	**16**	**47**	**41**	**17**	**132**
	SE	5	6	11	12	9	24
	% of row	*7*	*13*	*36*	*31*	*13*	*100*
	% of col	*5*	*4*	*4*	*11*	*9*	*5*
Nature conservation	**Area**	**0**	**2**	**13**	**9**	**7**	**31**
	SE	0	1	6	5	5	10
	% of row	*0*	*8*	*41*	*28*	*24*	*100*
	% of col	*0*	*1*	*1*	*2*	*4*	*1*
Public recreation	**Area**	**0**	**0**	**17**	**45**	**9**	**71**
	SE	0	0	11	27	9	37
	% of row	*0*	*0*	*24*	*63*	*13*	*100*
	% of col	*0*	*0*	*1*	*12*	*5*	*3*
Shelter	**Area**	**0**	**2**	**5**	**6**	**11**	**24**
	SE	0	2	2	2	6	7
	% of row	*1*	*10*	*20*	*24*	*46*	*100*
	% of col	*0*	*1*	*0*	*2*	*5*	*1*
Sporting/game	**Area**	**2**	**9**	**84**	**55**	**17**	**168**
	SE	1	4	18	23	6	32
	% of row	*1*	*5*	*50*	*33*	*10*	*100*
	% of col	*1*	*2*	*7*	*15*	*9*	*7*
Timber production	**Area**	**167**	**349**	**780**	**67**	**59**	**1422**
	SE	60	67	114	24	15	162
	% of row	*12*	*25*	*55*	*5*	*4*	*100*
	% of col	*88*	*77*	*63*	*18*	*29*	*58*
None	**Area**	**12**	**77**	**292**	**146**	**80**	**608**
	SE	6	27	39	29	17	65
	% of row	*2*	*13*	*48*	*24*	*13*	*100*
	% of col	*6*	*17*	*24*	*40*	*40*	*25*
Total	**Area**	**190**	**456**	**1239**	**369**	**201**	**2456**
	SE	61	73	123	53	28	183
	% of row	*8*	*19*	*50*	*15*	*8*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one use.

Table 7 The estimated area of woodland, together with associated standard error and percentages for all combinations of age and features. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

FEATURE		AGE 1-4	5-20	20-100	> 100	Not recorded	Grand Total
Bracken - dense	**Area**	**1**	**34**	**54**	**59**	**25**	**174**
	SE	1	19	14	21	11	38
	% of row	*0*	*20*	*31*	*34*	*15*	*100*
	% of col	*0*	*5*	*4*	*13*	*8*	*5*
Bracken - scattered	**Area**	**32**	**65**	**232**	**91**	**66**	**486**
	SE	22	22	41	28	16	68
	% of row	*7*	*13*	*48*	*19*	*14*	*100*
	% of col	*10*	*10*	*15*	*20*	*19*	*15*
Dead standing trees	**Area**	**4**	**10**	**53**	**27**	**15**	**109**
	SE	4	10	40	11	9	46
	% of row	*4*	*9*	*49*	*25*	*13*	*100*
	% of col	*1*	*2*	*3*	*6*	*4*	*3*
Felling/stumps	**Area**	**50**	**15**	**51**	**10**	**14**	**140**
	SE	27	10	15	6	6	35
	% of row	*36*	*11*	*36*	*7*	*10*	*100*
	% of col	*15*	*2*	*3*	*2*	*4*	*4*
Grazing (stock)	**Area**	**0**	**0**	**30**	**15**	**22**	**67**
	SE	0	0	9	5	10	14
	% of row	*0*	*0*	*45*	*23*	*32*	*100*
	% of col	*0*	*0*	*2*	*3*	*6*	*2*
Natural regeneration	**Area**	**14**	**40**	**121**	**84**	**88**	**346**
	SE	8	13	26	25	22	52
	% of row	*4*	*11*	*35*	*24*	*25*	*100*
	% of col	*4*	*6*	*8*	*18*	*26*	*11*
Planted	**Area**	**172**	**289**	**531**	**3**	**31**	**1025**
	SE	60	62	99	1	12	146
	% of row	*17*	*28*	*52*	*0*	*3*	*100*
	% of col	*52*	*46*	*35*	*1*	*9*	*31*
Ploughed land	**Area**	**28**	**60**	**1**	**0**	**4**	**94**
	SE	25	36	1	0	4	46
	% of row	*30*	*64*	*1*	*0*	*4*	*100*
	% of col	*9*	*9*	*0*	*0*	*1*	*3*
Regrowth - cut stump	**Area**	**1**	**0**	**5**	**6**	**2**	**13**
	SE	0	0	2	5	1	6
	% of row	*5*	*2*	*35*	*43*	*15*	*100*
	% of col	*0*	*0*	*0*	*1*	*1*	*0*
Ride/firebreak	**Area**	**0**	**6**	**10**	**0**	**4**	**19**
	SE	0	6	7	0	4	10
	% of row	*0*	*29*	*51*	*0*	*20*	*100*
	% of col	*0*	*1*	*1*	*0*	*1*	*1*
Staked trees	**Area**	**6**	**5**	**1**	**7**	**2**	**21**
	SE	4	2	1	6	2	8
	% of row	*27*	*21*	*6*	*35*	*11*	*100*
	% of col	*2*	*1*	*0*	*2*	*1*	*1*
Tree protectors	**Area**	**13**	**6**	**3**	**9**	**2**	**33**
	SE	5	2	1	7	2	9
	% of row	*39*	*18*	*10*	*27*	*7*	*100*
	% of col	*4*	*1*	*0*	*2*	*1*	*1*
Underplanting	**Area**	**0**	**0**	**8**	**9**	**0**	**17**

	SE	0	0	2	7	0	7
	% of row	*0*	*1*	*44*	*54*	*1*	*100*
	% of col	*0*	*0*	*1*	*2*	*0*	*1*
Windblow	**Area**	**0**	**10**	**68**	**22**	**25**	**125**
	SE	0	7	16	7	12	26
	% of row	*0*	*8*	*54*	*17*	*20*	*100*
	% of col	*0*	*2*	*4*	*5*	*7*	*4*
None	**Area**	**7**	**95**	**357**	**119**	**37**	**614**
	SE	5	33	66	29	9	88
	% of row	*1*	*15*	*58*	*19*	*6*	*100*
	% of col	*2*	*15*	*23*	*26*	*11*	*19*
Total	**Area**	**328**	**634**	**1525**	**461**	**337**	**3286**
	SE	75	86	138	55	39	210
	% of row	*10*	*19*	*46*	*14*	*10*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one feature.

Table 8 The estimated area of woodland, together with associated standard error and percentages for all combinations of condition and use. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

		CONDITION					
USE		**Managed**	**Unmanaged - thriving**	**Unmanaged - improvable**	**Declining**	**Not recorded**	**Total**
Landscape	**Area**	**45**	**55**	**8**	**4**	**20**	**132**
	SE	13	13	2	4	6	24
	% of row	*34*	*42*	*6*	*3*	*15*	*100*
	% of col	*3*	*13*	*6*	*15*	*6*	*5*
Nature conservation	**Area**	**15**	**10**	**0**	**0**	**6**	**31**
	SE	7	4	0	0	4	10
	% of row	*46*	*33*	*0*	*0*	*21*	*100*
	% of col	*1*	*2*	*0*	*0*	*2*	*1*
Public recreation	**Area**	**50**	**5**	**9**	**0**	**7**	**71**
	SE	30	3	9	0	7	37
	% of row	*70*	*7*	*12*	*0*	*10*	*100*
	% of col	*3*	*1*	*7*	*0*	*2*	*3*
Shelter	**Area**	**6**	**5**	**4**	**4**	**4**	**24**
	SE	5	2	2	2	2	7
	% of row	*25*	*20*	*19*	*18*	*19*	*100*
	% of col	*0*	*1*	*3*	*15*	*1*	*1*
Sporting/game	**Area**	**71**	**73**	**9**	**5**	**10**	**168**
	SE	19	23	4	4	4	32
	% of row	*42*	*44*	*5*	*3*	*6*	*100*
	% of col	*5*	*17*	*7*	*17*	*3*	*7*
Timber production	**Area**	**1222**	**59**	**15**	**8**	**117**	**1422**
	SE	151	25	5	6	35	162
	% of row	*86*	*4*	*1*	*1*	*8*	*100*
	% of col	*80*	*14*	*12*	*30*	*35*	*58*
None	**Area**	**127**	**219**	**81**	**6**	**175**	**608**
	SE	34	29	17	3	38	65
	% of row	*21*	*36*	*13*	*1*	*29*	*100*
	% of col	*8*	*51*	*64*	*23*	*51*	*25*
Total	**Area**	**1535**	**427**	**126**	**28**	**340**	**2456**
	SE	160	47	20	9	53	183
	% of row	*63*	*17*	*5*	*1*	*14*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one use.

Table 9 The estimated area of woodland, together with associated standard error and percentages for all combinations of features and condition. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

		CONDITION					
FEATURE		**Managed**	**Unmanaged - thriving**	**Unmanaged - improvable**	**Declining**	**Not recorded**	**Total**
Bracken - dense	**Area**	**73**	**51**	**16**	**0**	**34**	**174**
	SE	25	14	9	0	20	38
	% of row	*42*	*29*	*9*	*0*	*20*	*100*
	% of col	*4*	*9*	*8*	*1*	*8*	*5*
Bracken - scattered	**Area**	**268**	**131**	**38**	**9**	**41**	**486**
	SE	51	28	11	5	12	68
	% of row	*55*	*27*	*8*	*2*	*8*	*100*
	% of col	*13*	*23*	*19*	*27*	*9*	*15*
Dead standing trees	**Area**	**64**	**38**	**3**	**2**	**2**	**109**
	SE	43	14	2	1	1	46
	% of row	*59*	*35*	*3*	*2*	*2*	*100*
	% of col	*3*	*7*	*2*	*6*	*0*	*3*
Felling/ stumps	**Area**	**102**	**2**	**2**	**0**	**35**	**140**
	SE	29	2	1	0	22	35
	% of row	*73*	*2*	*1*	*0*	*25*	*100*
	% of col	*5*	*0*	*1*	*0*	*8*	*4*
Grazing (stock)	**Area**	**6**	**7**	**40**	**10**	**5**	**67**
	SE	3	3	12	4	1	14
	% of row	*9*	*10*	*60*	*15*	*7*	*100*
	% of col	*0*	*1*	*20*	*31*	*1*	*2*
Natural regeneration	**Area**	**106**	**167**	**42**	**4**	**26**	**346**
	SE	27	32	15	4	9	52
	% of row	*31*	*48*	*12*	*1*	*8*	*100*
	% of col	*5*	*29*	*21*	*14*	*6*	*11*
Planted	**Area**	**886**	**27**	**4**	**0**	**108**	**1025**
	SE	136	14	2	0	33	146
	% of row	*86*	*3*	*0*	*0*	*11*	*100*
	% of col	*43*	*5*	*2*	*0*	*25*	*31*
Ploughed land	**Area**	**83**	**0**	**1**	**4**	**6**	**94**
	SE	43	0	1	4	6	46
	% of row	*89*	*0*	*1*	*5*	*6*	*100*
	% of col	*4*	*0*	*0*	*14*	*1*	*3*
Regrowth - cut stump	**Area**	**9**	**2**	**0**	**0**	**2**	**13**
	SE	6	1	0	0	1	6
	% of row	*68*	*14*	*1*	*0*	*17*	*100*
	% of col	*0*	*0*	*0*	*0*	*1*	*0*
Ride/ firebreak	**Area**	**19**	**0**	**0**	**0**	**0**	**19**
	SE	10	0	0	0	0	10
	% of row	*100*	*0*	*0*	*0*	*0*	*100*
	% of col	*1*	*0*	*0*	*0*	*0*	*1*
Staked trees	**Area**	**19**	**1**	**0**	**0**	**2**	**21**
	SE	8	1	0	0	1	8
	% of row	*87*	*4*	*0*	*0*	*9*	*100*
	% of col	*1*	*0*	*0*	*0*	*0*	*1*
Tree protectors	**Area**	**24**	**0**	**0**	**0**	**9**	**33**
	SE	8	0	0	0	4	9
	% of row	*72*	*0*	*0*	*0*	*28*	*100*
	% of col	*1*	*0*	*0*	*0*	*2*	*1*
Under planting	**Area**	**15**	**2**	**0**	**0**	**1**	**17**

	SE	7	1	0	0	1	7
	% of row	*84*	*10*	*0*	*0*	*6*	*100*
	% of col	*1*	*0*	*0*	*0*	*0*	*1*
Windblow	**Area**	**55**	**28**	**29**	**1**	**11**	**125**
	SE	18	10	11	1	3	26
	% of row	*44*	*23*	*23*	*1*	*9*	*100*
	% of col	*3*	*5*	*14*	*5*	*2*	*4*
None	**Area**	**311**	**123**	**26**	**1**	**153**	**614**
	SE	73	19	8	0	34	88
	% of row	*51*	*20*	*4*	*0*	*25*	*100*
	% of col	*15*	*21*	*13*	*3*	*35*	*19*
Total	**Area**	**2040**	**578**	**201**	**32**	**435**	**3286**
	SE	182	54	28	9	58	210
	% of row	*62*	*18*	*6*	*1*	*13*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one feature.

Table 10 The estimated area of woodland, together with associated standard error and percentages for all combinations of use and feature. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), % of row - Percentage of the estimated area of woodland by row, % of col - Percentage of the estimated area of woodland by column.

FEATURE		USE							
		Landscape	Nature cons.	Public recreation	Shelter	Sporting/ game	Timber production	None	Total
Bracken - dense	**Area**	**9**	**5**	**8**	**1**	**15**	**51**	**86**	**175**
	SE	5	4	8	1	8	16	30	36
	% of row	*5*	*3*	*5*	*0*	*8*	*29*	*49*	*100*
	% of col	*4*	*11*	*9*	*2*	*6*	*3*	*10*	*5*
Bracken - scattered	**Area**	**41**	**3**	**21**	**9**	**77**	**252**	**155**	**558**
	SE	17	2	18	4	25	52	25	67
	% of row	*7*	*1*	*4*	*2*	*14*	*45*	*28*	*100*
	% of col	*19*	*8*	*24*	*23*	*31*	*12*	*18*	*16*
Dead standing trees	**Area**	**22**	**1**	**0**	**1**	**4**	**61**	**23**	**112**
	SE	10	1	0	1	2	43	11	46
	% of row	*20*	*1*	*0*	*1*	*4*	*54*	*21*	*100*
	% of col	*10*	*3*	*0*	*3*	*2*	*3*	*3*	*3*
Felling/stumps	**Area**	**4**	**0**	**0**	**1**	**10**	**128**	**9**	**152**
	SE	3	0	0	1	5	36	3	37
	% of row	*3*	*0*	*0*	*0*	*7*	*84*	*6*	*100*
	% of col	*2*	*1*	*0*	*2*	*4*	*6*	*1*	*4*
Grazing (stock)	**Area**	**2**	**0**	**9**	**12**	**0**	**6**	**39**	**68**
	SE	1	0	9	4	0	3	9	14
	% of row	*3*	*0*	*13*	*17*	*0*	*9*	*58*	*100*
	% of col	*1*	*0*	*10*	*29*	*0*	*0*	*5*	*2*
Natural regeneration	**Area**	**49**	**17**	**10**	**4**	**55**	**145**	**116**	**396**
	SE	17	7	9	2	22	36	23	52
	% of row	*12*	*4*	*3*	*1*	*14*	*37*	*29*	*100*
	% of col	*23*	*38*	*11*	*9*	*22*	*7*	*14*	*11*
Planted	**Area**	**30**	**1**	**0**	**1**	**23**	**909**	**93**	**1057**
	SE	10	1	0	1	7	141	30	145
	% of row	*3*	*0*	*0*	*0*	*2*	*86*	*9*	*100*
	% of col	*14*	*3*	*0*	*2*	*9*	*45*	*11*	*30*
Ploughed land	**Area**	**0**	**0**	**0**	**0**	**0**	**94**	**0**	**94**
	SE	0	0	0	0	0	46	0	46
	% of row	*0*	*0*	*0*	*0*	*0*	*100*	*0*	*100*
	% of col	*0*	*0*	*0*	*0*	*0*	*5*	*0*	*3*
Regrowth - cut stump	**Area**	**0**	**0**	**0**	**0**	**0**	**10**	**3**	**14**
	SE	0	0	0	0	0	6	1	6
	% of row	*0*	*0*	*0*	*0*	*3*	*72*	*25*	*100*
	% of col	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Ride/firebreak	**Area**	**0**	**0**	**0**	**0**	**0**	**19**	**0**	**19**
	SE	0	0	0	0	0	10	0	10
	% of row	*0*	*0*	*0*	*0*	*0*	*98*	*1*	*100*
	% of col	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*1*
Staked trees	**Area**	**6**	**1**	**0**	**0**	**1**	**4**	**12**	**24**
	SE	4	1	0	0	0	2	7	8
	% of row	*27*	*5*	*0*	*0*	*3*	*16*	*49*	*100*
	% of col	*3*	*3*	*0*	*0*	*0*	*0*	*1*	*1*
Tree protectors	**Area**	**12**	**2**	**0**	**1**	**4**	**6**	**13**	**38**
	SE	5	1	0	1	2	2	7	9
	% of row	*32*	*4*	*0*	*2*	*11*	*16*	*35*	*100*
	% of col	*6*	*3*	*0*	*2*	*2*	*0*	*2*	*1*
Underplanting	**Area**	**2**	**0**	**0**	**1**	**2**	**6**	**8**	**18**

	SE	1	0	0	1	1	2	6	7
	% of row	*12*	*1*	*0*	*4*	*10*	*31*	*42*	*100*
	% of col	*1*	*1*	*0*	*2*	*1*	*0*	*1*	*1*
Windblow	**Area**	**3**	**0**	**0**	**3**	**19**	**56**	**46**	**127**
	SE	2	0	0	2	9	16	14	24
	% of row	*3*	*0*	*0*	*2*	*15*	*44*	*36*	*100*
	% of col	*2*	*0*	*0*	*7*	*8*	*3*	*5*	*4*
None	**Area**	**33**	**13**	**40**	**8**	**42**	**280**	**237**	**654**
	SE	9	7	31	5	11	71	37	87
	% of row	*5*	*2*	*6*	*1*	*6*	*43*	*36*	*100*
	% of col	*15*	*30*	*45*	*20*	*17*	*14*	*28*	*19*
Total	**Area**	**214**	**44**	**89**	**40**	**251**	**2027**	**841**	**3507**
	SE	31	11	39	8	38	187	70	209
	% of row	*6*	*1*	*3*	*1*	*7*	*58*	*24*	*100*
	% of col	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*

NB The total estimate is more than the estimated area of woodland of 2312 '000 ha. This is due to double counting of woodland for which there was evidence of more than one use or feature.

Table 11 The estimated area of woodland, together with standard error and coefficient of variance for all unique combinations of uses. Area - National Estimate of the area of woodland ('000 ha), SE - Standard error of this estimate ('000 ha), %CV - Coefficient of variance. + indicates a figure of less than 500 ha. There were 12 multiple combinations of use, nine cases of two uses and three cases of three uses.

Use	Area	SE	%SE
Timber production	**1308**	156	12
None	**608**	65	11
Landscape	**99**	18	18
Timber production & Sporting/Game	**76**	25	33
Sporting/Game	**73**	15	21
Public recreation	**65**	37	57
Nature conservation	**21**	8	36
Shelter	**17**	5	28
Timber production & Landscape	**15**	8	56
Timber production & Landscape & Sporting/Game	**7**	5	73
Landscape & Sporting/Game	**6**	3	46
Timber production & Public recreation & Nature conservation	**5**	5	100
Timber production & Sporting/Game & Shelter	**5**	5	100
Landscape & Nature conservation	**3**	2	55
Public recreation & Nature conservation	**1**	1	100
Timber production & Shelter	**1**	1	70
Landscape & Shelter	**1**	+	71
Timber production & Nature conservation	+	+	100
Sporting/Game & Shelter	+	+	100
Total	**2312**		

Table 12 The estimated area of woodland, together with percentage, standard error and coefficient of variance for all unique combinations of features accounting for more than 1% of the total national estimate. Area - National Estimate of the area of woodland ('000 ha), % - percentage of the total area, SE - Standard error of this estimate ('000 ha) and %CV - Coefficient of variance. There were 111 multiple combinations of features recorded for woodland and in half of the estimated area of woodland more than one feature was present.

Features	Area	%	SE	%CV
None	614	*19*	88	14
Planted	596	*18*	104	17
Bracken scattered	166	*5*	34	20
Planted & Bracken scattered	92	*3*	34	36
Natural regeneration & Bracken scattered	90	*3*	29	32
Planted & Ploughed	85	*3*	41	48
Natural regeneration	62	*2*	14	23
Bracken dense	55	*2*	22	41
Felling & Planted	54	*2*	29	53
Planted & Bracken dense	32	*1*	19	61
Dead standing trees	28	*1*	18	63
Natural regeneration & Bracken dense	28	*1*	11	41
Planted & Dead standing trees	27	*1*	27	100
Natural regeneration & Planted	25	*1*	12	49
Windblow	22	*1*	5	23
Grazing & Bracken scattered	20	*1*	8	38
Natural regeneration & Windblow	17	*1*	10	60
Grazing	17	*1*	4	22
Natural regeneration & Dead standing trees & Bracken scattered	17	*1*	9	52

Table 13 Comparison of national estimates of area of woodland. Figures are the area woodland in '000 ha.

Country	FC 1980 census (1)	FC 1989-90 figures (2)	Ancient woodland (3)	Semi-natural ancient woodland (4)	CS1990 (5)
England	949	958	341	206	998
Wales	241	248	57	31	174
Scotland	920	1120	136	80	1140
Total	2110	2326	534	317	2312

Sources

1) Locke 1987

2) Forestry Commission Facts and Figures 1989-90

3) Roberts 1992

4) Barr 1993

9 Appendix

CS1990 codes relating to trees as described in the Field Survey Handbook (Barr, 1990)

(N.B. code numbers in parentheses are 'Primary codes' - there must always be at least one primary code describing a feature - and other codes are 'Secondary' - which may be used in combination to further describe the feature)

201 **Individual trees**: should be marked with a cross. Groups of less than 6 trees should be recorded as individuals as should lines of trees of less than 20 m in length. A coppice stool is recorded as a single tree.

202 **Scattered trees**: do not make a wood or clump (see definitions) because their crowns are not contributing 25% cover of the mapped unit.

203 **Line of trees**: must be single tree width and be at least 20 m long with crown contact. They should be marked with a line.

204 **Belt of trees**: 2 or more trees wide with a width to length ratio of at least 1:5, parallel-sided and with a maximum width of 50m.

205 **Clump of trees**: a small woodland or group of trees (6 or more) and of less than 0.25 ha.

206 **Woodland/Forest**: an area of trees of more than 0.25 ha (but see Belt) and a crown cover of more than 25%.

207 **Individual scrub**: consists exclusively of shrubby species often with tree regeneration and brambles. Individual trees of more than twice the average height of the scrub should be separately marked as individuals or scattered.

208 **Scattered scrub**: scattered as for trees.

209 **Line of scrub**: line as for trees.

210 **Patch of scrub**: an area of continuous scrub (canopy >25%) of any size.

215 **Closed canopy**: canopies touching or overlapping

216 **Canopies not touching**: to be used for linear features, if the gap between two canopies does not exceed the average canopy width of the two individuals on either side.

217 **Hedgerow**: trees in a hedgerow which are twice the average height of the hedge, or where the hedge has been trimmed to favour the growth of a young tree. They should be marked with an X.

218. **Parkland**: a series of isolated mature trees over usually grazed grassland, often associated with large country houses or recreational areas.

Species (if >25%) - should be recorded with one of the cover types if they constitute more than 25% of the canopy. It is not necessary to qualify "unspecified conifer" or "unspecified broadleaf" with a species name. The mixed category codes should be used in the same way ie when >25%.

221. **Fir - Douglas**
222. **Larch**
223. **Pine - Corsican**
224. **Pine - Lodgepole**
225. **Pine - Scots**
226. **Spruce - Norway**
227. **Spruce - Sitka**
228. **Unspecified conifer**

231. **Alder**
232. **Ash**
233. **Beech**
234. **Birch**
235. **Bramble**
236. **Elder**
237. **Elm**
238. **Field maple**

239. **Gorse**
240. **Hawthorn**
241. **Hornbeam**
242. **Lime**
243. **Oak**
244. **Poplar**
245. **Rowan**
246. **Sweet Chestnut**
247. **Sycamore**
248. **Willow**

250. **Mixed broadleaves**
251. **Mixed conifers**
252. **Unspecified broadleaf**

Proportions - these are for use with the tree species codes and should refer to the percentage cover of the dominant canopy layer. No more than three codes should be used to describe any one feature.

256. **25-50%**
257. **50-75%**
258. **75-95%**
259. **95-100%**

Age - should be used in conjunction with any of the cover-type codes.

To help with age category recognition the following table may be of use. These figures are a guideline and individuals will vary according to vigour, climate and other environmental factors, particularly fast-growing species of exotic origin. Further information is available in "Trees of Britain and Europe" by Mitchell.

Age (yrs.) Diam. at breast height

5 3-4 cm
20 18-20 cm
100 70-75 cm

261. **1-4 yrs**
262. **5-20 yrs**
263. **> 20 yrs**
264. **> 100 yrs**

Use - To be used for an area of trees (ie not individuals). It can be extremely difficult to decide the use and many woodlands, especially broadleaved, appear to have no particular use. These should be left uncoded in terms of use.

266. **Timber production**: all(?) coniferous forest and highly managed broadleaved woodland is likely to be included here.
267. **Landscape**: usually covering trees planted to improve the amenity of a site (usually visual amenity), or to fringe and 'hide' commercial plantations.
268. **Sporting/Game**: to be used if there is clear evidence that the wood is used to rear pheasants or other game birds.
269. **Public recreation**: where there is active encouragement for the public to use the area for recreation eg car parks, forest walks, arboreta etc.
270. **Nature conservation**: only to be used if there is clear evidence that the feature is being managed for nature conservation purposes.

271. **Shelter**: includes signs of wintering livestock as well as windbreaks etc.

Condition (to be used with woodland/forest >0.25 ha only)

275. **Managed**: to be used if there are clear signs of management activity for the primary use of the woodland area, eg, for timber production: weeding, thinning, brashing/snedding; for amenity: planting; for nature conservation: planting, scrub clearance etc
276. **Unmanaged - thriving**: no signs of active management but healthy trees, varied age structure and regeneration present.
277. **Unmanaged - improvable**: no signs of active management with healthy trees but no structure and grazing preventing natural regeneration
278. **Declining**: trees not healthy, often old, and with no structure and no regeneration; no longer woodland if existing trees removed.

Descriptions/Features

281. **Felling/Stumps**:
282. **Natural regeneration**: to be used only where tree species <1.3m high, which have grown naturally from seed (or suckers) are outside the canopy of a dominant woodland feature.
283. **Underplanting**: where semi-natural woodland has been under-planted with standard exotics or native species.
284. **Planted**: Planted may be used with any of the cover types where it is obvious that planting has taken place, rather than self-seeding.
285. **Ploughed land**: to be used where land has been ploughed (or scarified) in advance of forestry planting.
286. **Staked trees**: to be used for isolated trees only and not where 288 applies.
287. **Tree protectors**: light-weight plastic tubes (about 1 m high) which provide protection as well as a favourable micro-climate for planted trees.
288. **Fenced (single trees)**:
289. **Windblow**: can be used to qualify an area of forest or a single individual which has clearly been blown over, or had the top blown out, by wind.
290. **Dead standing tree(s)**: recorded either singly or as a description for an area of woodland.
291. **Regrowth - cut stump**: applies to isolated regenerating trees
292. **Grazing (stock)**: to be used if there is any evidence of agricultural stock using the feature for grazing, intentionally or otherwise.
293. **Ride/Firebreak**:
294. **Bracken dense**: any bracken in a woodland area must be recorded as for codes 156 and 157.
295. **Bracken scattered**: